

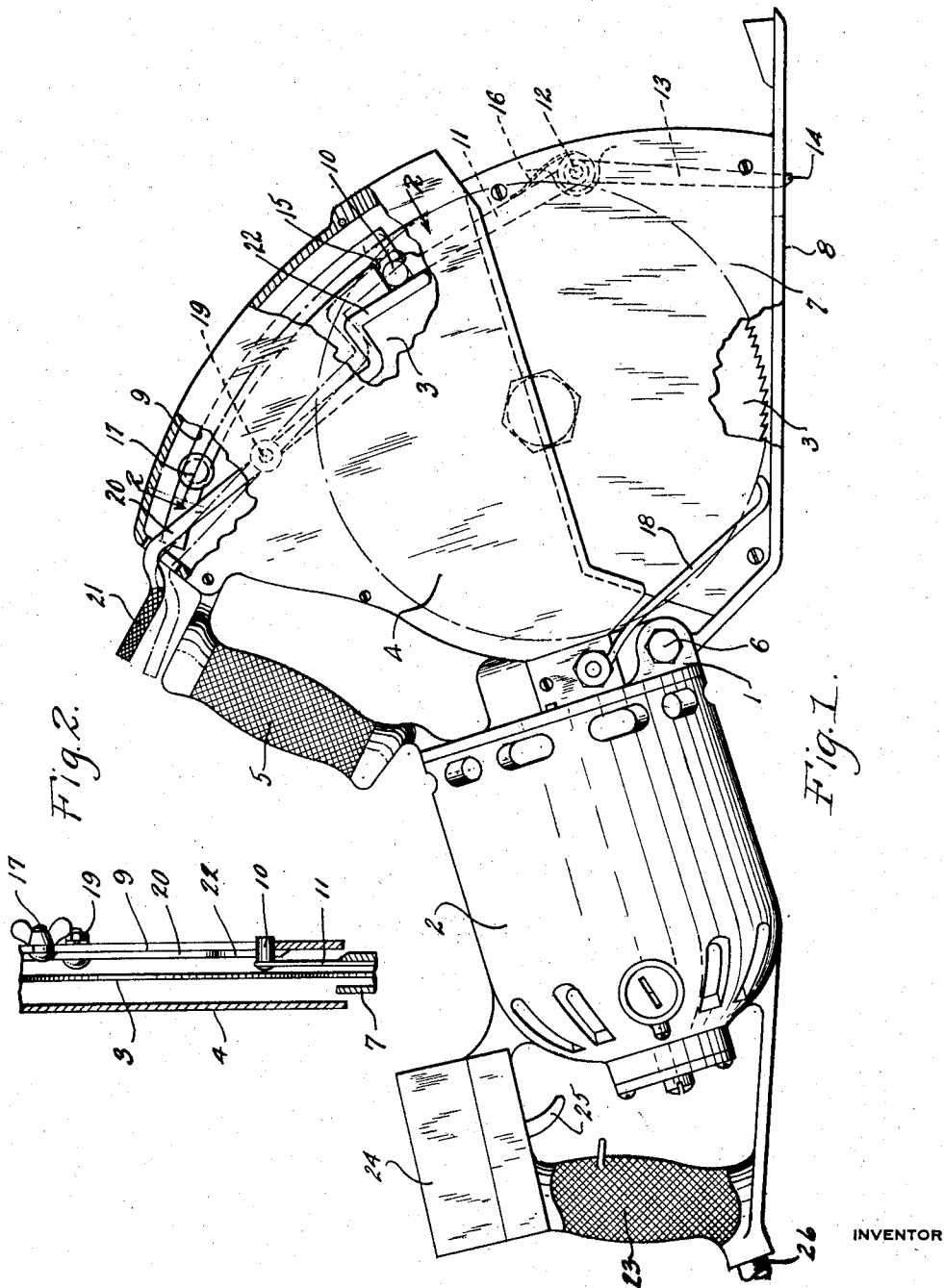
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MOTOR DRIVEN HAND TOOL

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MOTOR DRIVEN HAND TOOL

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This invention relates to portable power driven hand tools such as the so-called "electric saws" adapted to be applied bodily to the work and moved along the same by the operator; and this invention has especial reference to means and arrangement thereof whereby the tool may be efficiently and safely manipulated.

More particularly, the working manipulation of tools of the class described obviously involves considerable hazard to the operator unless proper guarding means be incorporated in the tool. For example, where a saw blade is used, having large sharp teeth traveling at a high linear speed, it is essential that guarding means be provided which protect the operator from the entire blade periphery. The provision of such guarding means is the subject matter of my Patent No. 1,644,326 of October 4, 1927.

Also, and as illustrated and described in my Patent No. 1,780,174 of November 4, 1930, in such a tool it is convenient and desirable to arrange the cutting blade forwardly of the motor which drives the same, and to provide the tool with two handles one generally over the blade, the other generally rearward of the motor, whereby in working position the tool is balanced between the handles, the entry of the blade into the work may be controlled primarily by the forward handle, and the tool may be carried about by the rearward handle alone, in a position generally depending from this handle. Particularly in such depending position the blade, lying as it does in proximity with the operator's knees, will if running and unless properly guarded inevitably seriously injure the operator.

For this reason the guarding means as shown in my patents above referred to, have been arranged to be yieldably urged to full guarding position and there latched, the latch being arranged for releasing actuation by engagement with the work. Occasionally, however, as where a cut is to be made other than beginning at an edge of the work, it is more practicable to release the guard by direct operator control.

More specifically, therefore, an object of my invention is to arrange in a tool of the class described, guarding means movably mounted on the tool frame to advance or recede to guard or expose a cutting portion of the tool blade, automatic means effective in all tool positions and tending to advance the guarding means, means also effective in all tool positions for automatically securing the guarding means against recession, a handle for manipulating the tool, and means associated with the handle for operator-operated release of the guarding means while the handle is grasped.

A further object of the invention is to provide for optional operator-operated release of guarding means arranged for normal release by engagement of the tool with the work.

Another object of the invention is to provide for operator-operated release of the guarding means in a tool having its blade located at its forward end, and a pair of longitudinally spaced handles one at the blade end; and associating the release means with the forward tool handle for actuation by the hand grasping this handle, whereby unless the blade end of the tool is supported by its handle, the guard cannot be released from full guarding position.

The exact nature of my invention together with further objects and advantages thereof will be apparent from the following description taken in connection with the accompanying drawings, which Fig. 1 shows, in side elevation, a tool of the class to which reference has been made and in which an embodiment of my invention has been incorporated, the tool being partly broken away to show details of construction, and dot-dash lines indicating alternate positions of certain of the parts; and Fig. 2 is a sectional detail as from line 2-2, Fig. 1.

With reference now to the drawings, the principal parts of the tool are the frame 1 secured with the motor 2 and having operatively mounted thereon to be driven by the motor, a cutting blade 3; it being understood that the axis of the motor runs longitudinally of the tool and that of the blade

transverse of the tool and in front of the motor, proper gearing, forming no part of this invention, being provided for the purpose.

The frame includes a fixed guard portion 4 which encloses the upper portion of the blade in hoodlike fashion, and a forward handle 5 serves to connect the base of the frame adjacent the motor with the upper extremity of the guard 4. Hinged to the frame as at 6 for telescoping movement within the fixed guard 4, is a movable guard 7 having a surface 8 adapted to engage and travel along the work, it being understood that the work engaging or runner portion of the movable guarding means is slotted in the plane of the blade 3 to allow passage of the working portion of the blade therethrough.

The fixed guard 4 is provided with a slot 9 arcuate about the axis 6, and the movable guarding means is provided with a roller 10 mounted upon a lever 11 which swings on an axis 12, and has an arm 13 with a toe 14 projecting, when the lever is in the position indicated, below the work engaging surface of the movable guarding means. The slot 9 terminates downwardly in the off-set portion 15 in which the roller 10 is shown as seated, and a spring 16 urges the lever 11 in counter-clockwise direction and consequently the roller 10 into the off-set 15, when the roller is aligned therewith, and otherwise against the inner edge of the slot 9. A bolt 17 is adjustable along the slot 9 and engageable by the roller 10 to limit telescoping movement of the movable guarding means. This guarding means is urged to its extreme downward position by a spring 18.

It will be apparent that the movable guarding means is mounted to advance or recede to guard or expose a cutting portion of the blade, that the spring serves as automatic means effective in all tool positions tending to advance the guarding means, and that the co-operation of the roller 10 with the slot 9 and particularly off-set 15 thereof serves as means also effective in all tool positions for automatically securing the movable guarding means against recession. Likewise when the toe 14 is pressed against the edge of work to be cut the roller 10 is disengaged from the off-set 15 whereupon the main portion of the tool including the motor 2 and the fixed guard 4 may tilt in clockwise direction upon the axis 6 to project a working portion of the blade 3 below the work engaging surface 8 of the so-called movable guard 7; such tilt, and thus the depth of cut, being limited by the adjusted portion of the stop bolt 17.

Pivotaly mounted upon the guard portion 4 of the frame as at 19, is a latch release lever 20 having a thumb piece 21 extending adjacent the handle 5, and a finger portion 22 extending adjacent the roller 10. The lever 20 is free to move on its axis, and when

the thumb piece 21 is depressed, moving the lever 20 from its full line position to its indicated dot-dash position, the roller 10 will be moved by the finger 22 from the notch 15 into its indicated dot-dash position at the base of the slot 9, this movement being against the spring 16 and unlatching the guard members 4 and 7 for telescoping movement against the action of the spring 18.

Rearward of the motor 2 are arranged a handle 23 and a switch-box 24, the switch-box containing a switch controlling the motor, and thus the saw blade, subject to manipulation of the trigger lever 25, a cable 26 being arranged to establish power connection to the switch.

As to operation, the rear handle of the tool is grasped by the right hand and the forward handle 5 by the left hand. The tool is nicely balanced between the handles, the center of gravity lying somewhere within the confines of the motor, which is the heaviest portion of the tool. The tool is thus presented to the work, and where a cut is to begin at an edge of the work the latch is released by engagement of the toe 14 therewith. The motor being energized by the right forefinger acting on the switch lever 25 the blade is set in motion. the handle 5 is depressed, tilting the frame about the axis 6 to lower a working portion of the blade below the runner 8, and the tool is advanced until the blade bites into the work. The blade, once the work is engaged, draws itself therinto, and the blade being lowered to its limit as determined by the position of the stop bolt 17, the handle 5 may be released and the tool advanced by means of the handle 23 alone to complete the cut.

Normally the motor is then stopped by release of the switch trigger 25 and the tool removed from the work by its two handles. Should, however, the tool by any carelessness run off the end of the work, or at any time be dislodged from the work, and swing downwards toward the operator's knees, the movable guard means immediately snaps back and is latched in the full guarding position shown, so that the operator is not injured as he would otherwise be. Such functioning of the guarding means is important, particularly since once the tool is started on its cut, the forward handle 5 may be and often is in practice released, the tool being guided merely by the rear handle 23, so that if or when run off the work the tool tends to swing downwards against the operator.

When a cut is to be started in a work surface it is difficult to release the latch by means of the toe 14. Under such conditions, provided the handle 5 is grasped, the thumb piece 21 may be depressed, unlatching the guard so that the blade may be pressed into the work by means of the handle 5.

Thus it is only while the handle 5 is grasped that the latch may be released directly by operator effort, and even though unlatched, immediately the handle 5 is released the guard is in a sense pre-set for movement and latching in full guarding position, instantly the tool be moved accidentally or otherwise to a position involving danger to the operator.

What I claim is:

1. In a portable power driven hand tool adapted to be applied bodily to the work and moved along the same by the operator, a frame, a cutting blade operatively mounted thereon, a motor for operating said blade, guarding means movably mounted on said frame to advance or recede to guard or expose a cutting portion of said blade, and comprising a base having a surface adapted to engage and travel along the work, automatic means effective in all tool positions and tending to advance said guarding means, means also effective in all tool positions for automatically securing said guarding means against recession, a handle arranged adjacent said blade, and means associated with said handle for operator-operated release of said guarding means while the handle is grasped.

2. In a portable power driven hand tool adapted to be applied bodily to the work and moved along the same by the operator, a frame, a cutting blade operatively mounted thereon, a motor for operating said blade, guarding means movably mounted on said frame to advance or recede to guard or expose a cutting portion of said blade, and comprising a base having a surface adapted to engage and travel along the work, automatic means effective in all tool positions and tending to advance said guarding means, means also effective in all tool positions for automatically securing said guarding means against recession, a handle for manipulating the tool, and means for releasing said guarding means adapted for actuation by engagement with the work and means associated with said handle for operator-operated release of said guarding means while said handle is grasped.

3. In a portable power driven hand tool adapted to be applied bodily to the work and moved along the same by the operator, a frame, a cutting blade operatively mounted thereon, a motor for operating said blade, a fixed guard rigidly associated with the frame for guarding a portion of said blade, guarding means movably mounted on said frame to advance or recede to guard or expose a cutting portion of said blade and comprising a base having a surface adapted to engage and travel along the work, automatic means effective in all tool positions and tending to advance said guarding means, latch means also effective in all tool posi-

tions for locating the limit of advance of said guarding means and for automatically securing the same against recession when in fully advanced position, said fixed guard and said movable guarding means being arranged to guard the entire cutting edge of said blade when the guarding means is in said fully advanced position, a handle for manipulating the tool, means adapted for actuation by engagement with the work for releasing said latch to allow recession of said guarding means, and means associated with said handle for actuation by the operator to effect release of said latch.

4. In a portable power driven hand tool adapted to be applied bodily to the work and moved along the same by the operator, a frame, a cutting blade operatively mounted at the forward end thereof, a motor for operating said blade and arranged rearwardly thereof, guarding means movably mounted on said frame to advance or recede to guard or expose a cutting portion of said blade, and comprising a base having a surface adapted to engage and travel along the work, automatic means effective in all tool positions and tending to advance said guarding means, means also effective in all tool positions for automatically securing said guarding means against recession, a pair of longitudinally spaced handles for manipulating the tool, and means associated with the forward handle for releasing said guarding means while said forward handle is grasped.

5. In a portable power driven hand tool adapted to be applied bodily to the work and moved along the same by the operator, a frame, a cutting blade operatively mounted at the forward end thereof, a motor for operating said blade and arranged rearwardly thereof, guarding means movably mounted on said frame to advance or recede to guard or expose a cutting portion of said blade, and comprising a base having a surface adapted to engage and travel along the work, automatic means effective in all tool positions and tending to advance said guarding means, means also effective in all tool positions for automatically securing said guarding means against recession, a pair of longitudinally spaced handles for manipulating the tool, means associated with the rearward handle for controlling said motor, and means associated with the forward handle for releasing said guarding means while said forward handle is grasped.

6. In a portable tool, a frame, a cutting blade operatively mounted thereon, means for operating said blade, guarding means adapted to advance or retreat to guard or expose a cutting portion of said blade, means tending to advance said guarding means, means for securing said guarding means against accidental retreat, means

adapted for actuation by engagement with the work for releasing said guarding means to allow the same to retreat, a handle for said tool, and means associated with said handle for operator-operated release of said guarding means while the handle is grasped. In testimony whereof I hereby affix my signature.

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